

CLAIMS

1. (Amended) A process for thermally treating an article made from an alloy comprising at least aluminum and copper but substantially free of scandium, the process comprising:

solid solution heat treating the article;

quenching the article;

heating the article to a first temperature of from about 275 to about 340°F;

artificially aging the article at the first temperature for a duration of at least 30 minutes;

and

artificially aging the article at a second temperature of from about 325 to about 380°F for a duration of from about 4 hours to about 36 hours, the second temperature being greater than the first temperature by at least 10°F.

2. The process of claim 1 further including performing cold work to the article prior to the artificially aging at the first temperature.

3. The product formed by the process of claim 1.

4. The process of claim 1, wherein the alloy further includes lithium.

5. (Amended) The process of claim 4, wherein the alloy further includes an additive selected from the group consisting of zinc, magnesium, silver, manganese, silicon, zirconium, chromium, vanadium, indium, iron, hafnium, yttrium, lanthanides and combinations thereof.

6. (Amended) The process of claim 1, wherein the alloy further includes an additive selected from the group consisting of zinc, magnesium, silver, manganese, silicon, lithium and combinations thereof.

7. (Amended) The process of claim 1, wherein the alloy further includes an additive selected from the group consisting of zirconium, chromium, vanadium, indium, iron, hafnium, yttrium, lanthanides and combinations thereof.

8. The process of claim 1, wherein the alloy comprises from about 0.1 to about 10 wt.% copper.

9. The process of claim 1, wherein the alloy comprises from about 1 to about 6.5 wt.% copper and from about 0.5 to about 3 wt.% lithium, with the balance aluminum and incidental elements and impurities.

10. (Amended) The process of claim 1, wherein the alloy further comprises an additive selected from the group consisting of lithium, magnesium, silver and zirconium.

11. The process of claim 1, wherein the article is solid solution heat treated at a temperature from about 880 to about 1,030°F.

12. The process of claim 1, wherein the article is artificially aged at the first temperature for a duration of from about 6 hours to about 50 hours.

13. The process of claim 1, wherein the second temperature is greater than the first temperature by from about 15 to about 50°F.

14. The process of claim 1, wherein the article is artificially aged at the first temperature of from about 310 to about 330°F for a duration of from about 12 to about 36 hours and the article is artificially aged at the second temperature of from about 340 to about 355°F for a duration of from about 4 to about 24 hours.

15. (Amended) A process for improving strength to an article made from an alloy that has been hot deformed and fast cooled, the alloy comprising at least aluminum and copper but substantially free of scandium, the process comprising:

heating the article to a first temperature of from about 275 to about 340°F;
artificially aging the article at the first temperature for a duration of at least 30 minutes;
and
artificially aging the article at a second temperature of from about 325 to about 380°F for
a duration of from about 4 to about 36 hours, the second temperature being greater than the first
temperature by at least 10°F.

16. The product formed by the process of claim 15.
17. The process of claim 15, wherein the alloy further includes lithium.
18. The process of claim 15, wherein the alloy comprises from about 0.1 to about 10 wt.% copper.
19. The process of claim 15, wherein the alloy comprises from about 1 to about 6.5 wt.% copper and from about 0.5 to about 3 wt.% lithium, with the balance aluminum and incidental elements and impurities.
20. The process of claim 15, wherein the second temperature is greater than the first temperature by from about 15 to about 50°F.
21. The process of claim 15, wherein the article is artificially aged at the first temperature of from about 310 to about 330°F for a duration of from about 12 to about 36 hours and the article is artificially aged at the second temperature of from about 340 to about 355°F for a duration of from about 4 to about 24 hours.
- 22. A process for thermally treating an article made from an alloy comprising at least aluminum, copper and silver, the process comprising:
solid solution heat treating the article;
quenching the article;

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heating the article to a first temperature of from about 275 to about 340°F;
artificially aging the article at the first temperature for a duration of at least 30 minutes;
and
artificially aging the article at a second temperature of from about 325 to about 380°F for
a duration of from about 4 hours to about 36 hours, the second temperature being greater than the
first temperature by at least 10°F.

23. A process for improving strength to an article made from an alloy that has been
hot deformed and fast cooled, the alloy comprising at least aluminum, copper and silver the
process comprising:

heating the article to a first temperature of from about 275 to about 340°F;
artificially aging the article at the first temperature for a duration of at least 30 minutes;
and
artificially aging the article at a second temperature of from about 325 to about 380°F for
a duration of from about 4 to about 36 hours, the second temperature being greater than the first
temperature by at least 10°F.

24. A process for thermally treating an article made from an AA2195 alloy, the
process comprising:

solid solution heat treating the article;
quenching the article;
heating the article to a first temperature of from about 275 to about 340°F;
artificially aging the article at the first temperature for a duration of at least 30 minutes;
and

artificially aging the article at a second temperature of from about 325 to about 380°F for a duration of from about 4 hours to about 36 hours, the second temperature being greater than the first temperature by at least 10°F.

25. A process for improving strength to an article made from an AA2195 alloy that has been hot deformed and fast cooled, the process comprising:

heating the article to a first temperature of from about 275 to about 340°F;

artificially aging the article at the first temperature for a duration of at least 30 minutes;

and

artificially aging the article at a second temperature of from about 325 to about 380°F for a duration of from about 4 to about 36 hours, the second temperature being greater than the first temperature by at least 10°F.

26. A process for thermally treating an article made from an alloy comprising at least aluminum and copper, the process comprising:

solid solution heat treating the article;

quenching the article;

heating the article to a first temperature of from about 310 to about 330°F for a duration of from about 12 to about 36 hours;

artificially aging the article at the first temperature for a duration of at least 30 minutes;

and

artificially aging the article at a second temperature of from about 340 to about 355°F for a duration of from about 4 hours to about 24 hours, the second temperature being greater than the first temperature by at least 10°F.

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27. A process for improving strength to an article made from an alloy that has been hot deformed and fast cooled, the alloy comprising at least aluminum and copper, the process comprising:

heating the article to a first temperature of from about 310 to about 330°F for a duration of from about 12 to about 36 hours;

artificially aging the article at the first temperature for a duration of at least 30 minutes;
and

artificially aging the article at a second temperature of from about 340 to about 355°F for a duration of from about 4 to about 24 hours, the second temperature being greater than the first temperature by at least 10°F. --

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